

AMENDMENTS TO THE CLAIMS

1. (Currently amended) An energy-curable coating composition comprising a water-soluble or water-dispersible binder capable of being polymerised by exposure to a source of radiation, a particulate electrically conductive material, and water as a non-reactive diluent, and, ~~if necessary~~ optionally, a photoinitiator, the composition, when cured, having a resistivity no greater than 1 ohm/square, as measured by ASTM F1896-98.
2. (Original) A composition according to Claim 1, in which the binder comprises at least a polymerisable monomer, prepolymer or oligomer capable of polymerisation by radiation and including at least one component which is water-soluble or water-dispersible.
3. (Currently amended) A composition according to Claim 2, in which the binder comprises a water-soluble or water-dispersible oligomer or prepolymer capable of being polymerised by radiation ~~and/or~~ a water-soluble monomer capable of being polymerised by radiation, or both and optionally a water-insoluble monomer capable of being polymerised by radiation.
4. (Original) A composition according to Claim 3, in which the binder comprises:
 - (a) a water-soluble or water-dispersible oligomer or prepolymer capable of being polymerised by radiation,
 - (b) a water-soluble monomer capable of being polymerised by radiation,
 - (c) a water-insoluble monomer capable of being polymerised by radiation,
 - (d) a particulate electrically conductive material,

(e) water as a solvent or dispersant, and

(f) optionally a photoinitiator.

5. (Currently amended) A composition according to ~~any one of Claims 1 to 4~~ Claim 1, in which the binder comprises a water- soluble or water-dispersible urethane, polyester or epoxy resin containing acrylate ester groups ~~and/or residues~~ or both.

6. (Currently amended) A composition according to Claim 4, in which said water-soluble or water-dispersible oligomer or prepolymer (a) is a water-soluble or water-dispersible urethane, polyester or epoxy resin containing acrylate ester groups ~~and/or residues~~ or both.

7. (Currently amended) A composition according to ~~any one of Claims 1 to 6~~ Claim 1, in which the binder comprises an ester of acrylic or methacrylic acid with polyethylene glycol or with a mono-, di-, tri-, or tetra-hydric alcohol derived by ethoxylating a mono-, di-, tri-, or tetra-hydric aliphatic alcohol of molecular weight less than 200 with ethylene oxide.

8. (Original) A composition according to Claim 4, in which said water-soluble monomer (b) is an ester of acrylic or methacrylic acid with polyethylene glycol or with a mono-, di-, tri-, or tetra-hydric alcohol derived by ethoxylating a mono-, di-, tri-, or tetra-hydric aliphatic alcohol of molecular weight less than 200 with ethylene oxide.

9. (Currently amended) A composition according to ~~any one of Claims 1 to 8~~ Claim 1, in which the binder includes an acrylate or methacrylate ester of a mono-, di-, tri-, tetra-, penta-, or hexa-hydric alcohol preferably having a molecular weight of less than 300.

10. (Original) A composition according to Claim 4, in which said water-insoluble monomer (c) is an acrylate or methacrylate ester of a mono-, di-, tri-, tetra-, penta-, or hexa-hydric alcohol preferably having a molecular weight of less than 300.

11. (Currently amended) A composition according to ~~any one of the preceding Claims~~ Claim 1, in which said electrically conductive material is a metal or metal oxide.

12. (Original) A composition according to Claim 11, in which said metal is silver, copper, nickel, tin, or platinum, or a mixture or alloy including at least one of these metals.

13. (Currently amended) A composition according to ~~any one of Claims 4, 6, 8 and 10~~ Claim 4, in which said water-soluble or water-dispersible oligomer or prepolymer (a) is present in an amount of from 2 to 15% by weight of the total composition.

14. (Currently amended) A composition according to ~~any one of Claims 4, 6, 8, 10 and 13~~ Claim 4, in which said water-soluble monomer (b) is present in an amount of from 2 to 10% by weight of the total composition.

15. (Currently amended) A composition according to ~~any one of Claims 4, 6, 8, 10, 13 and 14~~ Claim 4, in which said water-insoluble monomer (c) is present in an amount of from 1 to 8% by weight of the total composition.

16. (Currently amended) A composition according to ~~any one of Claims 4, 6, 8, 10, 13 and 14~~ Claim 4, in which said conductive material (d) is present in an amount such that the weight ratio of (d) to (a) plus (b) plus (c) is at least 2: 1.

17. (Original) A composition according to Claim 16, in which said ratio is at least 3: 1.

18. (Original) A composition according to Claim 17, in which said ratio is no greater than 6:1.

19. (Currently amended) A composition according to ~~any one of the preceding Claims~~ Claim 1, in which said conductive material is present in an amount of from 30 to 90% by weight of the total composition.

20. (Currently amended) A composition according to ~~any one of Claims 1, 2, 3, 5, 7, 9, 11 and 12~~ Claim 1, in which said conductive material is present in an amount of at least 35% by weight of the total composition.

21. (Original) A composition according to Claim 20, in which said conductive material is present in an amount of at least 40% by weight of the total composition.

22. (Currently amended) A composition according to ~~any one of the preceding Claims~~ Claim 1, in which said water is present in an amount of from 1 to 60% of the total composition.

23. (Original) A composition according to Claim 22, in which said water is present in an amount of from 1 to 40% of the total composition.

24. (Currently amended) A composition comprising:

(a) from 2 to 15%, ~~more preferably from 4 to 14%~~, by weight of a water-soluble or water-dispersible oligomer or prepolymer capable of being polymerised by radiation,

(b) from 2 to 10%, more preferably from 2 to 9%, by weight of a water-soluble monomer capable of being polymerised by radiation,

(c) from 1 to 8% by weight, ~~more preferably from 3 to 7% by weight~~, of a water-insoluble monomer capable of being polymerised by radiation,

(d) sufficient of a particulate electrically conductive material that the ratio of said electrically conductive material to components (a), (b) and (c) is at least 2:1, ~~preferably at least 3:1,~~

(e) from 1 to 60%, ~~more preferably from 1 to 40%,~~ by weight of water as a non reactive diluent, and

(f) optionally from 0.5 to 10%, ~~more preferably from 1 to 5%,~~ by weight of a photoinitiator, the composition, when cured, having a resistivity no greater than 1 ohm/square, as measured by ASTM F1896-98.

25. (Currently amended) A composition according to ~~any one of the preceding Claims~~ Claim 1, having, when cured, a resistivity no greater than 10^{-1} ohm/square, as measured by ASTM F1896-98.

26. (Currently amended) A composition according to ~~any one of the preceding Claims~~ Claim 25, having, when cured, a resistivity no greater than 10^{-2} ohm/square, as measured by ASTM F1 896-98.

27. (Currently amended) A process for producing a printed electrically conductive coating, in which a composition according to ~~any one of the preceding Claims~~ Claim 1 is printed onto a substrate, and is then energy cured by exposure to a source of actinic radiation.

28. (Original) A process according to Claim 27, in which said radiation is ultraviolet or electron beam.

28. (New) A composition comprising:

(a) from 4 to 14% by weight of a water-soluble or water-dispersible oligomer or prepolymer capable of being polymerised by radiation,

(b) from 2 to 9%, by weight of a water-soluble monomer capable of being polymerised by radiation,

(c) from 3 to 7% by weight of a water-insoluble monomer capable of being polymerised by radiation,

(d) sufficient of a particulate electrically conductive material that the ratio of said electrically conductive material to components (a), (b) and (c) is at least 3:1

(e) from 1 to 40% by weight of water as a non reactive diluent, and

(f) from 1 to 5% by weight of a photoinitiator, the composition, when cured, having a resistivity no greater than 10^{-2} ohm/square, as measured by ASTM F1896-98.